(1) Acceptable test results on a PFD of sufficiently similar design.

(2) Engineering analysis showing that the test is not applicable to the particular design or that by design or construction the PFD cannot fail the test.

(c) *Alternative Requirements.* A PFD that does not meet requirements in this subpart may still be approved if the device—

(1) Meets other requirements prescribed by the Commandant in place of or in addition to requirements in this subpart; and

(2) Provides at least the same degree of safety provided by other PFD's that do comply with this subpart.

[CGD 78–174, 50 FR 33928, Aug. 22, 1985, as amended by CGD 78–174A, 51 FR 4351, Feb. 4, 1986. Redesignated and amended by CGD 78–174, 60 FR 2491, Jan. 9, 1995]

§ 160.077–7 Procedure for approval of design or material revision.

(a) Each change in design, material, or construction of an approved PFD must be approved by the Commandant before being used in any production of PFDs.

(b) Determinations of equivalence of design, construction, and materials may be made only by the Commandant.

[CGD 78–174, 60 FR 2492, Jan. 9, 1995]

§ 160.077–9 Recognized laboratory.

(a) A manufacturer seeking Coast Guard approval of a product under this subpart shall follow the approval procedures of subpart 159.005 of this chapter, and shall apply for approval directly to a recognized independent laboratory. The following laboratories are recognized under §159.010–7 of this part, to perform testing and approval functions under this subpart: Underwriters Laboratories, 12 Laboratory Drive, P.O. Box 13995, Research Triangle Park, NC 27709–3995, (919) 549–1400.

(b) Production oversight must be performed by the same laboratory that performs the approval tests unless, as determined by the Commandant, the employees of the laboratory performing production oversight receive training and support equal to that of the laboratory that performed the approval testing.

[CGD 93–055, 61 FR 13931, Mar. 28, 1996; 61 FR 15868, Apr. 9, 1996]

§ 160.077–11 Materials—Recreational Hybrid PFD's.

(a) *General*—(1) *Application.* This section contains requirements for materials used in recreational hybrid PFD's.

(2) *Condition of Materials.* All materials must be new.

(3) *Acceptance, certification, and quality.* All components used in the construction of hybrid PFDs must meet the applicable requirements of subpart 164.019 of this chapter.

(4) *Temperature range.* Unless otherwise specified in standards incorporated by reference in this section, all materials must be designed for use in all weather conditions throughout a temperature range of −30 °C to +65 °C (−22 °F to +150 °F).

(5) *Weathering Resistance.* Each nonmetallic component which is not suitably covered to shield against ultraviolet exposure must be designed to—

(i) Retain at least 40% of its strength after being subjected to 300 hours of sunshine carbon arc weathering as specified by Method 5804.1 of Federal Test Method Standard Number 191; or

(ii) Meet UL 1517, section 4.3.

(6) *Fungus Resistance.* Each non-metallic component must be designed to retain at least 90% of its strength after being subjected to the mildew resistance test specified by Method 5762 of Federal Test Method Standard 191 when untreated cotton is used as the control specimen. Also, the gas transmission rate of inflation chamber materials must not be increased by more than 10% after being subjected to this test. Materials that are covered when used in the PFD may be tested with that covering.

(7) *Corrosion resistance.* Each metal component must be—

(i) Galvanically compatible with each other metal part in contact with it; and

(ii) Unless it is expendable (such as an inflation medium cartridge), 410 stainless steel or have salt water and salt air corrosion characteristics equal or superior to 410 stainless steel or perform its intended function, and have no

visible pitting or other damage on any surface, after 720 hours of salt spray testing according to ASTM B 117 (incorporated by reference, see §160.077–5).

(8) *Materials not covered.* Materials not covered in this section must be of good quality and suitable for the purpose intended.

(b) *Flotation material.* Inherent buoyancy must be provided by—

(1) Plastic foam meeting—

(i) Subpart 164.013 of this chapter;

(ii) Subpart 164.015 of this chapter; or

(iii) UL 1191 and having a V factor of 89 except that foam with a lower V factor may be used if it provides buoyancy which, after a normal service life, is at least equal to that of a PFD made with material having a V factor of 89 and the required minimum inherent buoyancy when new; or

(2) Kapok meeting subpart 164.003 of this chapter.

(c) *Fabric*—(1) *All fabric.* All fabric, except inner envelope fabric, must—

(i) Be of a type accepted for use on Type I PFD's approved under subpart 160.002 of this chapter; or

(ii) Meet the Type V requirements for ''Fabrics for Wearable Devices'' in UL 1191, except that its breaking strength must be at least 400 N (90 lb.) in both the directions of greater and lesser thread count.

(2) *Rubber coated fabric.* Rubber coated fabric must be of a copper-inhibiting type.

(3) *Inner envelope fabric.* Inner envelope fabric must—

(i) Meet the requirements in paragraph (c)(i) of this section; or

(ii) Be of a type accepted for use on Type II PFD's approved under subpart 160.047 of this chapter.

(d) *Inflation chamber materials*—(1) *All materials.* The average permeability of inflation chamber material must not be more than 110% of the permeability of materials determined in approval testing prescribed in §160.077–19(d). The average grab breaking strength and tear strength of the material must be at least 90% of the grab breaking strength and tear strength determined from testing prescribed in §160.077–19(d). No individual sample result for breaking strength or tear strength may be more than 20% below the results obtained in approval testing.

(2) *Fabric covered chambers.* Each material used in the construction of inflation chambers that are covered with fabric must meet the requirements specified for—

(i) Bladder materials in section 3.2.6 of MIL-L-24611(SH) if the material is an unsupported film, except that any color or finish may be used; or

(ii) Coated fabric in section 3.1.1 of TSO-C13 if the material is a coated fabric.

(3) *Uncovered chambers.* Each material used in the construction of inflation chambers that are not covered with fabric must meet the requirements specified in paragraph (d)(2)(ii) and (a)(5)(i) of this section.

(e) *Thread.* Each thread must meet the requirements of subpart 164.023 of this chapter. Only one kind of thread may be used in each seam. Thread and fabric combinations must have similar elongation and durability characteristics.

(f) *Webbing.* Webbing used as a body strap, tie tape or drawstring, or reinforcing tape must meet §160.002–3(e), §160.002–3(f), and §160.002–3(h) of this chapter respectively. Webbing used for tie tape or drawstring must be capable of easily holding a knot and being easily tied and untied. Webbing used as reinforcing tape must be smooth enough to prevent chafing the wearer.

(g) *Closures*—(1) *Strength.* Each closure such as a buckle, snap hook and dee ring, or other type of fastening must comply with UL 1517, section 4.1. The width of each closure opening through which body strap webbing passes must be the same as the width of that webbing.

(2) *Means of Locking.* Each closure used to secure a PFD to the body, except a zipper, must have a quick and positive means of locking, such as a snap hook and dee ring.

(3) *Zipper.* If a zipper is used to secure a PFD to the wearer it must be—

(i) Easily initiated;

(ii) Non-jamming;

(iii) Right handed; and

(iv) Of a locking type.

(h) *Inflation medium.* If a hybrid PFD has an automatic or manual inflation mechanism—

(1) The inflation medium must not contain or produce compounds more

toxic than CO_2 in sufficient quantity to cause an adverse reaction if inhaled through any of its oral inflation mechanisms; and

(2) Any chemical reaction during inflation must not leave a toxic residue.

(i) [Reserved]

(j) *Kapok pad covering.* If kapok flotation material is used, pad covering that meets §160.047–3(e) of this chapter must be provided to enclose the material in at least three separate pads.

[CGD 78–174, 50 FR 33928, Aug. 22, 1985, as amended by CGD 84–068, 58 FR 29494, May 20, 1993; CGD 78–174, 60 FR 2486, Jan. 9, 1995; USCG–2000–7790, 65 FR 58463, Sept. 29, 2000]

§160.077–13 Materials—Type I and Commercial Hybrid PFD.

(a) *General.* All commercial hybrid PFD materials must meet §160.077–11 and this section.

(b) *Closures.* Each closure other than a zipper must have a minimum breaking strength of 1000 N (225 lbs). If a zipper is used to secure the PFD to the body, it must be used in combination with another closure that has a quick and positive means of locking.

(c) *Retroreflective Material.* Each PFD must have at least 200 sq. cm. (31 sq. in.) of retroreflective material on its front side, at least 200 sq. cm. on its back side and at least 200 sq. cm. of material on each reversible side, if any. The material must be Type I material that is approved under Subpart 164.018 of this chapter. The material attached on each side must be divided equally between the upper quadrants of the side. The material, as attached, must not impair PFD performance.

[CGD 78–174, 50 FR 33928, Aug. 22, 1985, as amended by CGD 78–174, 60 FR 2487, Jan. 9, 1995]

§160.077–15 Construction and Performance—Recreational Hybrid PFD.

(a) *Performance.* (1) Each recreational hybrid PFD must be able to pass the tests in §160.077–19.

(2) Each recreational hybrid PFD must—

(i) If second stage donning is required, have an obvious method for doing it;

(ii) If it is to be marked as Type II or Type V providing Type I or II performance, not require second stage donning to achieve that performance;

(iii) Be capable of being worn while inflated at 60 N (13 lb.) of buoyancy without significantly changing its appearance from, or making it significantly less comfortable than, the uninflated condition;

(iv) Not cause significant discomfort to the wearer during and after inflation; and

(v) If it has a manual or automatic inflation mechanism and can be put on inside out, not restrict breathing when donned inside out, adjusted to fit, and inflated.

(b) *Construction; General.* Each recreational hybrid PFD must—

(1) Have one or more inflation chambers;

(2) Have at least one oral means of inflation on each inflation chamber;

(3) Have at least one automatic inflation mechanism that inflates at least one chamber, if marked as providing Type I or II performance;

(4) Be constructed so that the intended method of donning is obvious to an untrained wearer;

(5) Not have a channel that can direct water to the wearer's face to any greater extent than that of the reference vest defined in §160.077–3(j).

(6) Have a retainer for each adjustable closure to prevent any part of the closure from being easily removed from the PFD;

(7) If marked as universally sized for wearers weighing over 40 kg (90 pounds), have a chest size range of at least 76 to 120 cm (30 to 52 in.);

(8) Not have means of access to any inherently buoyant inserts;

(9) Not have edges, projections, or corners, either external or internal, that are sufficiently sharp to damage the PFD or cause injury to anyone using or maintaining the PFD;

(10) Be of first quality workmanship;

(11) Unless otherwise allowed by the approval certificate—

(i) Not incorporate means obviously intended for attaching the PFD to the vessel; and

(ii) Not have any instructions indicating that attachment is intended;

(12) Except as otherwise required by this section, meet UL Standard 1517,